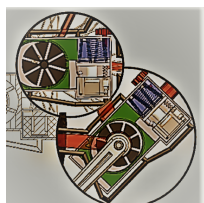


THA-R Bicycle

Pedal and transmit all the power you want, without chains! Bicycle with a self-regulating transmission system, with no chain and no gear changes.



Contact information

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Technological Offers type

[Technological solutions](#)

Research and innovation areas

- [Climate, Energy and Mobility](#)

ODS



Where?

[Mechanical Engineering Modelling and Simulation](#)

Keywords: | [bike](#) | [transport](#)

Brief description of the solution and the added value it delivers

Bicycle with a self-regulating hydraulic transmission system (THA-R in Spanish), in which the chain, chainrings, sprockets and gear-shifting system are replaced by a system comprising a hydraulic pump and motor, which are connected to each other and positioned on the bicycle's bottom bracket and rear wheel, respectively, making the bicycle easier to use and maintain, as well as being more robust and easier and cheaper to manufacture. The self-regulating nature of the system is based on the pressure inside the hydraulic circuit caused by the force exerted by the rider when peddling, which causes a change in the cubic capacity of the pump and the motor and, therefore, in their rotation transformation ratio, providing smoother transmission than in traditional bicycles and doing so continuously.

Description of the technological basis

Bicycle with a self-regulating hydraulic transmission system, in which the chain, chainrings, sprockets and gear-shifting system are replaced by a mechanical system comprising a hydraulic pump and motor, which are connected to each other and positioned on the bicycle's bottom bracket and rear wheel, respectively, making the bicycle easier to use and maintain, as well as being more robust and easier to manufacture.

The self-regulating nature of this technology is based on the force exerted by riders when peddling and provides smoother transmission than in traditional bicycles, doing so continuously and entirely autonomously.

'It does away with the chain, chainrings, sprockets and auxiliary transmission regulation components'

Business needs / application

- There are currently more than one billion bicycles used worldwide as a means of transport. Plus, recent years have seen a boom in the uptake of electric bicycles due to their ease of use. However, this has given rise to a regulatory and environmental problem, making it necessary to work in a direction that is compatible with what already exists but also brings some innovation to the table, considering that the basic design and configuration of the transmission system has changed very little since its creation in 1885.
- With regard to sport and leisure, market needs are trending towards bicycles that are more comfortable for the user and components that require less maintenance and are therefore easier to use. In top-level competition, the needs are mainly focused on highly reliable and ever more innovative components, and the transmission system, being the most problematic, is one of the systems into which most effort is being put in order to make progress.

Competitive advantages

- Cost reduction; self-regulating according to the requirements of the route and without any interaction by the rider or auxiliary systems; shock-resistant and easy to maintain, as it is a closed and self-lubricated system.
- Clean and environmentally friendly system that is not vulnerable to the elements.
- Noise reduction, as there are very few components in contact with each other and there are no gear transitions, as the change is smooth and continuous.

References

Interest in the design from a leading company in the sector of certain high-end bicycle components. This company manufactures in Italy and has a strong international presence, with customers throughout Europe and the USA.

Industrial protection

Patent granted in Spain: ES2623359B2.

Stage of development

- Concept
- Research
- **Lab prototype**
- Industrial prototype
- Production

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